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Factsheet

NUTRIENT COMPOSITION OF PIG FEED INGREDIENTS (ON AN AS FED AND DRY MATTER BASIS)

(Replaces Factsheet "Average Composition of Some Pig Feeds", June 1981)

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This Factsheet is designed as a **guide only** for the on-farm feed mixer. It should be used in conjunction with Factsheets, *Nutrient Recommendations for Pigs on an "As Fed" and "Dry Matter" Basis, Agdex 440/52*, and *Practical Diets for Pigs, Agdex 440/50*. Producers who want to feed by-products will require further nutrient information for diet formulation and should consult with OMAF, university or feed industry nutritionists. All diets made on the farm should be checked by lab analysis for accuracy.

Included in the Factsheet are: some definitions of feed terms, a conversion table and a table listing the major nutrients found in common pig feed ingredients (based on OMAF and NRC figures).

Digestible energy values for the feeds listed are given in megajoules (MJ) only. For conversion to megacalories, see conversion table. All nutrients listed are shown on an as fed and dry matter basis.

A. DEFINITION OF FEED TERMS

1. **Availability of a nutrient** is the extent to which a nutrient can be used by a pig.

2. **By-products** are products which are left after the manufacture of a desired product. For example, soybean meal is a by-product of the oil extraction industry and corn gluten meal is a by-product of the corn starch industry.

3. **Digestible Energy** is the amount of energy in a feed ingredient which can be absorbed by a pig. This value is calculated by subtracting the energy content of undigested particles in the manure from the gross energy content of the original diet or feed ingredient.

4. **Crude protein and lysine** is a measure of the total amount of protein and lysine found in a feed ingredient, not the amount that is available to the pig. The table of nutrient composition in this Factsheet uses crude values for protein and lysine.

* *The Technical Advisory Committee for Swine Nutrition is composed of OMAF, University and Feed Industry Nutritionists.*

B. TABLE 1. CONVERSION EQUATIONS

Unit Given	Unit Wanted	Equation
As Fed (AF)	Dry Matter (DM)	AF/(%DM/100) = DM
Dry Matter (DM)	As Fed (AF)	DM X (%DM/100) = AF
Megajoule (MJ)	Megacalorie (Mcal)	MJ X 0.239 = Mcal
Megacalorie (Mcal)	Megajoule (MJ)	Mcal X 4.186 = MJ

eg. In a diet containing 88% DM and 15% crude protein (AF), the protein content on a dry matter basis is: 15/(88/100) =17.0%

C. NUTRIENT COMPOSITION OF PIG FEED INGREDIENTS

Table 2 shows the nutrient composition of pig feed ingredients on both a dry matter and as fed basis. The nutrient values were taken from NRC and OMAF data.

Nutrient contents between different ingredients should be compared on a dry matter basis, discarding the diluting effect of moisture. Diets containing high moisture feeds (such as high moisture corn) should be balanced on a dry matter basis for greater accuracy.

D. VITAMIN AND MINERAL CONTENTS OF PIG FEED INGREDIENTS

Only the calcium and phosphorus levels are reported in Table 2. The content and availability of the other minerals and vitamins vary largely between different ingredients and even between different samples of single ingredients. Vitamins such as A, D, E, K, B_{12}, niacin, riboflavin, and biotin and minerals such as selenium, copper, manganese, iron, zinc and iodine are best added to the diets in the form of commercial premixes and supplements. Calcium, phosphorus and salt could be added separately. When animal products and bakery waste are used, special attention should be paid to salt level.

Table 2. NUTRIENT COMPOSITION OF PIG FEEDS ON AS FED (AF) & DRY MATTER (DM) Basis (Source: NRC and OMAF Data)

FEED INGREDIENT		DRY MATTER (DM) %	DIGESTIBLE ENERGY (DE) MJ/kg	CRUDE PROTEIN (CP) %	LYSINE (LYS) %	CALCIUM (Ca) %	PHOSPHORUS (P) %	CRUDE FAT (CFT) %	CRUDE FIBRE (CFB) %
Alfalfa Meal	As Fed:	92.00	8.74	20.20	0.90	1.60	0.28	-	20.70
(20% CP)	Dry:	100.00	9.50	21.96	0.98	1.74	0.30	-	22.50
*Bakery Waste	As Fed:	91.60	15.91	10.90	0.30	0.06	0.47	6.00	0.70
(dried)	Dry:	100.00	17.37	11.90	0.33	0.07	0.51	6.55	0.76
Barley (Ont.)	As Fed:	87.28	12.56	10.51	0.34	0.07	0.37	1.83	5.85
	Dry:	100.00	14.39	12.04	0.39	0.08	0.42	2.10	6.70
Barley (Western)	As Fed:	88.00	13.35	11.60	0.39	0.05	0.35	1.90	5.00
(46 lbs./bu.)	Dry:	100.00	15.17	13.18	0.44	0.06	0.40	2.16	5.68
Beans, white	As Fed:	88.00	15.61	23.00	1.40	0.15	0.52	1.50	4.20
(cull)	Dry:	100.00	17.74	26.14	1.59	0.17	0.59	1.70	4.77
Beet Pulp	As Fed:	91.00	12.34	8.25	0.60	0.63	0.09	0.55	18.02
(dried)	Dry:	100.00	13.56	9.07	0.66	0.69	0.10	0.60	19.80
Brewers grains	As Fed:	92.00	10.40	27.05	0.90	0.30	0.51	6.62	13.25
(dried)	Dry:	100.00	11.30	29.40	0.98	0.33	0.55	7.20	14.40
Canola Meal	As Fed:	91.00	13.23	34.00	2.00	0.61	0.95	2.15	12.01
	Dry:	100.00	14.54	37.36	2.20	0.67	1.04	2.36	13.20
Corn (Ont.)	As Fed:	85.00	14.59	8.74	0.26	0.07	0.28	3.66	2.47
(15% moisture)	Dry:	100.00	17.16	10.28	0.31	0.08	0.33	4.31	2.91
Corn, (Ont.)	As Fed:	72.00	12.34	7.40	0.22	0.06	0.24	3.10	2.01
High moisture	Dry:	100.00	17.14	10.28	0.31	0.08	0.33	4.31	2.79
(28%)									
Corn + Cob	As Fed:	81.16	12.20	7.85	0.17	0.04	0.24	3.00	7.63
Meal	Dry:	100.00	15.03	9.67	0.21	0.05	0.30	3.70	9.40
Corn Gluten	As Fed:	90.00	13.41	23.04	0.64	0.32	0.74	2.16	8.73
Feed	Dry:	100.00	14.90	25.60	0.71	0.36	0.82	2.40	9.70
Corn Gluten	As Fed:	90.00	16.61	60.48	1.01	0.07	0.49	2.16	1.98
Meal	Dry:	100.00	18.46	67.20	1.12	0.08	0.54	2.40	2.20
Fat (tallow)	As Fed:	99.00	38.75	-	-	-	-	98.51	-
	Dry:	100.00	39.14	-	-	-	-	99.51	-
Fat (soy oil)	As Fed:	99.00	31.44	-	-	-	-	95.40	-
	Dry:	100.00	31.76	-	-	-	-	96.36	-
*Fish Meal	As Fed:	92.00	14.64	61.36	4.74	5.20	2.91	9.66	0.92
	Dry:	100.00	15.91	66.70	5.15	5.65	3.16	10.50	1.00
Lupin beans	As Fed:	87.00	15.19	35.70	1.68	0.18	0.40	9.60	10.70
(sweet, white)	Dry:	100.00	17.47	41.03	1.93	0.21	0.46	11.03	12.30

Meat meal (Ont.)	As Fed:	95.00	15.35	51.50	2.65	8.17	3.87	10.96	2.28
	Dry:	100.00	16.16	54.21	2.79	8.60	4.07	11.54	2.40
Milk, Skim (dried)	As Fed:	94.00	16.22	33.65	2.54	1.28	1.02	0.85	0.19
	Dry:	100.00	17.26	35.80	2.70	1.36	1.09	0.90	0.20
Milk, Whole (dried)	As Fed:	96.00	22.14	25.63	2.26	0.91	0.73	28.32	-
	Dry:	100.00	23.06	26.70	2.35	0.95	0.76	29.50	-
Mixed grain (Ont. 50/50)	As Fed:	87.04	11.84	10.70	0.35	0.08	0.36	3.22	7.70
	Dry:	100.00	13.60	12.29	0.40	0.09	0.41	3.70	8.85
Oats (Ont.)	As Fed:	88.49	11.33	10.72	0.35	0.08	0.35	4.78	10.71
	Dry:	100.00	12.80	12.11	0.40	0.09	0.40	5.40	12.10
Oats (Western) (34 lbs./bu.)	As Fed:	88.50	11.55	11.10	0.39	0.07	0.33	4.80	10.50
	Dry:	100.00	13.05	12.54	0.44	0.08	0.37	5.42	11.86
Oats, Tibor (Hulless)	As Fed:	90.00	15.44	12.60	0.42	0.07	0.43	6.75	2.94
	Dry:	100.00	17.16	14.00	0.47	0.08	0.48	7.50	3.27
Peas (field)	As Fed:	89.50	15.40	23.80	1.58	0.11	0.42	1.30	5.50
	Dry:	100.00	17.21	26.59	1.77	0.12	0.47	1.45	6.15
Soybean meal (44%)	As Fed:	89.00	13.86	44.40	2.76	0.30	0.62	1.34	6.23
	Dry:	100.00	15.57	49.89	3.10	0.34	0.70	1.51	7.00
Soybean meal (47%)	As Fed:	90.00	16.16	47.00	2.96	0.26	0.63	0.90	3.58
	Dry:	100.00	17.96	52.22	3.29	0.29	0.70	1.00	3.98
Soybean meal (48%)	As Fed:	90.00	16.16	48.60	3.10	0.26	0.63	0.90	3.33
	Dry:	100.00	17.96	54.00	3.44	0.29	0.70	1.00	3.70
Soybeans (roasted/extruded)	As Fed	92.00	17.37	38.82	2.46	0.26	0.61	18.40	5.15
	Dry:	100.00	18.88	42.20	2.67	0.28	0.66	20.00	5.60
Triticale (Ont.)	As Fed:	90.00	15.63	15.93	0.53	0.07	0.43	6.21	2.52
	Dry:	100.00	17.37	17.70	0.59	0.08	0.48	6.90	2.80
Wheat, bran	As Fed	89.00	10.14	15.22	0.59	0.12	1.23	3.92	10.06
	Dry:	100.00	11.39	17.10	0.66	0.13	1.38	4.40	11.30
Wheat, Western (hard red spring)	As Fed:	88.00	12.96	13.50	0.31	0.03	0.38	1.76	2.55
	Dry:	100.00	14.73	15.34	0.35	0.03	0.43	2.00	2.90
Wheat, Ont. (soft white winter)	As Fed:	89.90	15.43	10.16	0.31	0.06	0.32	1.71	2.34
	Dry:	100.00	17.16	11.30	0.34	0.07	0.36	1.90	2.60
Wheat Middlings	As Fed:	89.00	13.04	15.31	0.47	0.12	0.88	3.20	2.67
	Dry:	100.00	14.65	17.20	0.53	0.13	0.99	3.60	3.00
Wheat Shorts	As Fed:	88.00	13.08	16.37	0.78	0.09	0.80	4.58	6.78
	Dry:	100.00	14.86	18.60	0.89	0.10	0.91	5.20	7.70
*Whey (dried)	As Fed:	93.00	13.32	13.21	0.93	0.86	0.76	0.65	0.19
	Dry:	100.00	14.32	14.20	1.00	0.90	0.82	0.70	0.20

**Salt content high: bakery waste, 2.9% (AF) and 3.2% (DM); Fish meal, 1.0% (AF) and 1.1% (DM); whey , 1.7% AF and 1.8% (DM)*

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